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**"MOBILITY" FOOTWEAR REDUCES DYNAMIC LOADS IN SUBJECTS WITH OSTEOARTHRITIS OF THE KNEE**N. Shakoor, R.H. Lidtke, M. Sengupta, R. Trombley, J.A. Block  
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**Purpose:** Dynamic joint loading is important in the pathophysiology of osteoarthritis (OA) of the knee, and the prevalence and progression of knee OA are known to be associated with high dynamic loading. We have previously demonstrated that in subjects with OA of the knee, walking barefoot significantly decreases peak knee loads compared to walking with standard walking shoes (*Arthritis Rheum* 54:2923, '06). These results suggest a potential biomechanical advantage of "natural foot mobility" for lower extremity joint loading. Subsequently, we designed a shoe to incorporate essential features of natural foot motion. Here, we compare both peak and overall knee loads when walking with this "mobility" shoe compared to walking with conventional walking shoes.

**Methods:** Thirty-one subjects with radiographic and symptomatic knee OA underwent gait analyses using an optoelectronic camera system and multi-component force plate. Subjects were evaluated for gait while 1) wearing a "mobility" shoe, designed to provide maximum foot flexibility and motion and 2) wearing their self-chosen conventional walking shoes. Subjects walked at their normal walking speed, and comparisons were performed on runs matched for speed. The primary endpoints for the study were gait parameters that reflected the extent of medial compartment knee loading and included the peak external knee adduction moment (PAddM) and the adduction angular impulse (AddImp). The PAddM is the external adduction moment of greatest magnitude during the stance phase of the gait cycle. The AddImp is the integral of the knee adduction moment over time and has recently been shown to be more sensitive than the PAddM in predicting the radiographic severity of medial compartment knee OA. Paired t-tests were used to compare differences in these parameters during the two footwear conditions.

**Results:** 27 females and 4 males were evaluated, with mean age ( $\pm$ SD) of  $61 \pm 11$  years. There were no significant differences in speed during the walking conditions ( $1.16 \pm 0.23$  vs  $1.15 \pm 0.25$  m/sec,  $p=0.842$ ). There was an 8% reduction in the PAddM ( $2.73 \pm 0.76$  vs  $2.51 \pm 0.80$  %BW\*ht,  $p<0.001$ ) and a 7% reduction in the AddImp ( $0.96 \pm 0.45$  vs  $0.89 \pm 0.45$  %BW\*ht,  $p<0.016$ ) with the "mobility" shoe compared to subjects' conventional walking shoes.

**Conclusions:** This study demonstrates that a shoe designed to incorporate the biomechanical advantages of barefoot walking effectively reduces dynamic knee loads during gait. In light of these findings, closer examination of the design and biomechanical effects of modern footwear on the prevalence and progression of lower extremity OA is warranted.

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**INDIRECT COMPARISON OF CLINICAL EFFICACY ACROSS COCHRANE REVIEWED PHYSIOTHERAPY INTERVENTIONS FOR PATIENTS WITH OSTEOARTHRITIS: A META-ANALYSIS WITH MIXED TREATMENT COMPARISONS**H. Lund Sr., R. Christensen Sr., H. Bliddal  
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**Purpose:** There have been numerous of systematic reviews of interventions designed to diminish pain and improve function for patients with OA, but the comparable effectiveness of such interventions is unclear. To assess the clinical efficacy of physiotherapeutic (PT) modalities and interventions available in

library of Cochrane reviews, on the pain and disability in patients with osteoarthritis (OA), applying data from published systematic Cochrane reviews of RCTs.

**Methods:** The Cochrane Library was searched for Cochrane reviews considering patients with OA and different physiotherapeutic interventions with the aim of reducing pain, and disability. A meta-regression analysis was applied, for the mixed treatment comparisons, applying the individual study's standardized mean difference (SMD) as outcome measure, for pain and disability, respectively. The statistical random-effects model was based on a restricted maximum likelihood (REML), mixed-effects model procedure with intervention as fixed- and trial as random-factor, respectively. The within study variance was considered known for each published RCT, based on the explicit SDs presented in each of the original Cochrane reviews. A negative SMD favors the intervention on trial.

**Results:** The search with "osteoarthritis" in the title resulted in 35 reviews. Reasons for exclusion was protocols (K=12), pharmacological treatments and surgery (K=15), withdrawn (K=1) and 1 study compared two different kinds of treatment (K=1). Thus, 6 Systematic Cochrane Reviews were included in the meta-regression model (patients included, N= 3,016): Lateral wedged insoles (LWI, pain k=1; disability k=1), electromagnetic field therapy (EMF, pain k=2; disability k=2), exercise (EXE, pain k=17; disability k=18), ultrasonic therapy (UST, pain k=1; disability k=0), thermotherapy (THT, pain k=1; disability k=1), and transcutaneous electrical nerve stimulation (TENS, pain k=6, disability k=1). Based on the indirect meta-analysis we were able to rank these 6 mutually independent interventions according to the published efficacy on pain; data are presented in descending efficacy (SMD) order with the corresponding p-value: EMF (SMD: -1.13,  $p=0.003$ ); THT[cold] (SMD: -0.69,  $p=0.21$ ); TENS (SMD: -0.45,  $p=0.003$ ); EXE (SMD: -0.43,  $p=0.0001$ ); LWI (SMD: 0.31,  $p=0.45$ ); UST (SMD: 0.43,  $p=0.34$ ). According to the published efficacy on disability: THT[cold] (SMD: -1.96,  $p<0.0001$ ); EMF (SMD: -0.81,  $p=0.002$ ); TENS (SMD: -0.60,  $p=0.08$ ); EXE (SMD: -0.34,  $p<0.0001$ ); LWI (SMD: 0.30,  $p=0.24$ ).

**Conclusions:** Based on this mixed treatment comparison, we provide quantitative evidence-based efficacy ranking of the PT interventions currently available as an updated Cochrane review. Based on the reported pain and disability reduction, it is highly evident ( $p<0.0001$ ) that exercise therapy does benefit the patient; although not necessarily with the largest magnitude of efficacy. Of the other therapies tested, both EMF and TENS showed a relevant effect size of moderate statistical significance ( $p=0.003$  respectively  $p=0.03$ ) on pain. In addition, THT and EMF showed a clinically relevant effect size on disability reduction ( $p<0.0001$  respectively  $p=0.002$ ). The present indirect-comparison provide the clinician a review of the modalities to choose, accordingly LWI, UST might not be effective in the treatment of osteoarthritis.

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**IS WHOLE-BODY VIBRATION (WBV) EXERCISE OR WBV EXERCISE COMBINED WITH BALANCE EXERCISE IN FEMALE PATIENTS WITH OSTEOARTHRITIS IN THE KNEE A POTENTIAL REHABILITATION INTERVENTION?**J. Aaboe<sup>1</sup>, T. Trans<sup>2</sup>, H. Lund<sup>1</sup>, M. Henriksen<sup>1</sup>,  
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**Purpose:** To assess the effect of whole-body vibration exercise on muscle strength, proprioceptive acuity, and balance in female patients with knee osteoarthritis (KOA).

**Methods:** This study was a singleblinded, randomised, con-